

# PATENT ABSTRACTS OF JAPAN

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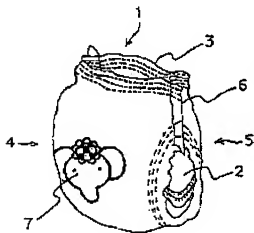
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## (54) PRINTING OF ABSORPTIVE WEARING ARTICLE AND ABSORPTIVE WEARING ARTICLE SUBJECTED TO PRINTING

(57)Abstract:

PROBLEM TO BE SOLVED: To apply designs and patterns recognizable from the outside of an absorptive wearing article to this article in arbitrary positions and in arbitrary shapes.

SOLUTION: At the time of producing the absorptive wearing article having a liquid permeable top sheet, a liquid impermeable back sheet and an absorptive material arranged between both sheets, the printing patterns recognizable from the outer side at the time of wearing are applied to the article by ink jet printing. Further, the ink jet printing is executed in an assembly stage which successively assembles the respective component materials of the absorptive wearing article while un-winding.



## CLAIMS

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[Claim(s)]

[Claim 1] It has a fluid permeability top sheet, a backseat of fluid impermeability, and an absorber arranged among these both sheets, A printing method of an absorptivity wearing article which is a printing method of an absorptivity wearing article in which a printing pattern which can be recognized from the exterior at the time of wear is given, and is characterized by giving this printing pattern by ink jet printing to a predetermined member of this absorptivity wearing article.

[Claim 2] One or more layers of outer layer sheets in which said absorptivity wearing article becomes the outside of a backseat from a nonwoven fabric etc. are arranged, A printing method of the absorptivity wearing article according to claim 1 giving a printing pattern which can be recognized from the exterior at the time of wear to the at least 1st of this backseat and these outer layer sheet surface and rear surfaces by ink jet printing.

[Claim 3] A printing method of the absorptivity wearing article according to claim 1 or 2 setting and giving like an assembler who assembles and goes while rewinding continuously each member which constitutes said absorptivity wearing article for said ink jet printing to a predetermined member.

[Claim 4] A fluid permeability top sheet.  
A backseat of fluid impermeability.

An absorber arranged among these both sheets.

A printing pattern which can be recognized from the exterior is given to the 1st [ at least ] page of a member which is the absorptivity wearing article to which printing provided with the above was performed, and has been arranged at a position which can be recognized from the exterior of an absorptivity wearing article at the time of wear by ink jet printing.

## DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention relates to the absorptivity wearing article printed by the printing method which gives a printing pattern to the member of an absorptivity wearing article, and this printing method in the manufacturing process of an absorptivity wearing article.

[0002]

[Description of the Prior Art] Conventionally, the absorptivity wearing article has an absorber arranged between a fluid permeability top sheet, the backseat of fluid impermeability, and these both sheets.

Mainly hold with an absorber excrement, such as urine excreted at the time of wear, via a fluid permeability top sheet, and by the backseat of fluid impermeability. It is used as that which prevents excrement beginning to leak out of an absorptivity wearing article, and the thing of various gestalten, such as having an extensible elastic member and a fastener for immobilization so that it may use according to the use and can be used as an absorptivity wearing article of \*\*\*\*, and being beforehand formed in the trousers type, is devised.

[0003] As the above-mentioned absorptivity wearing article, the usage \*\*\*\* diaper for infants, the object for adult's incontinentia persons, or the usage \*\*\*\* diaper for person requiring cares is devised, and it is used widely.

[0004] It adds to the operation which holds original excrement for article itself to these absorptivity wearing article, Although a means to make a wearer do wear immobilization of the article, a means by which shut up excrement in an article and displeasure is not given to a wearer, and a means to make it excrement not begin to leak out of an article possess, and these means act effectively and constitute the article, For example, when wearing oneself said absorptivity wearing article in which the small child was formed in the trousers type, or when a care worker makes it wear to an adult, it is also necessary to have the means which makes distinction of a rear surface easy before and after a wear nature article.

[0005] If it doubles also when these absorptivity wearing articles have the necessity of using that from which size differed according to a wearer's form and the usage \*\*\*\* diaper for infants is considered especially, It will become a required function if establishing a picture pattern which the size indication which can be distinguished, and infants like at a glance also considers the simple nature at the time of use, and the amenity.

[0006] For this reason, so that recognition may become possible from the outside of an absorptivity wearing article conventionally, Printing beforehand a product brand name, product size, and the picture pattern in which infants, such as an animal and a vehicle, are fond in for infants to the backseat of fluid impermeability or the fastener for immobilization, or arranging a picture pattern in specific positions, such as a backseat, for the purpose, such as distinction of a rear surface, is performed widely.

[0007] However, printing of a picture pattern etc. is made when the assembler of an absorptivity wearing article prints a picture pattern beforehand in a front process to

individual materials, such as a backseat which forms an absorptivity wearing article, and a fastener, more.

The printing means for such materials is performing flexographic printing, gravure printing, etc. generally, and is performed.

[0008]

[Problem(s) to be Solved by the Invention] Since flexographic printing currently performed from the former and gravure printing are performed by the engraved printing roll to the material of each member which constitutes an absorptivity wearing article, they cannot but become what continued at the interval with a constant picture pattern of the limited kind. That is, since the outside diameter size of a printing roll has a limit, thereby, the kind of picture pattern of the absorptivity wearing article in which the kind of picture pattern which can be continuously printed into the material of a predetermined member is a limit, and at most 4-5 kinds can put it in 1 package unit for shipment is also restricted. When assembling and manufacturing an absorptivity wearing article, (It sets like an assembler), Since rewind continuously the material of each member which constitutes the absorptivity wearing article generally rolled round by printed rolled form, it is supplied from a feed unit, it \*\*\*\*s to predetermined length through an adhesion assembly and the article is manufactured, it is difficult to arrange a picture pattern to the specific position of these members in a finished product. And when describing the character of product size in material, Since it becomes impossible to use as a material of the article of different size even if material widths were the same, when carrying out size \*\*\*\* (change to manufacture of the product in which sizes differ) in the middle of manufacture, inconvenience arises and efficient manufacture becomes impossible.

[0009] In [ this invention solves the above problems and ] manufacture of an absorptivity wearing article, It enables it to increase the kind of printing pattern given to an absorptivity wearing article, and to print a printing pattern easily to the specific position of an absorptivity wearing article. It realizes enabling it to print the distinction sign (pattern) etc. which were not being printed conventionally, to change a printing pattern easily with the variety in the middle of manufacture, or change of size further, etc., and let not only raising the simple nature and the visual degree of satisfaction at the time of a user's use but improvement in productive efficiency be the purpose. In manufacture of an absorptivity wearing article, this invention person finds out giving the printing pattern which can be recognized from an outside surface at the time of wear by ink jet printing, and came to complete this invention.

[0010]

[Means for Solving the Problem] The 1st of this invention A fluid permeability top sheet and a backseat of fluid impermeability, It is a printing method for manufacture of an absorptivity wearing article which has an absorber arranged among these both sheets and in which a printing pattern which can be recognized from the exterior at the time of wear is given, It is a printing method of an absorptivity wearing article giving this printing pattern by ink jet printing to a predetermined material of this absorptivity wearing article. Words and phrases of a printing pattern in this invention mean a printing content at large [, such as a picture pattern, a sign, and a character, ].

[0011] The 2nd of this invention has composition for which an absorptivity wearing article of the 1st invention has arranged one or more layers of outer layer sheets which

become the outside of a backseat from a nonwoven fabric etc., It is a printing method of an absorptivity wearing article indicated to the 1st invention giving a printing pattern which can be recognized from the exterior at the time of wear to the at least 1st of this backseat and these outer layer sheet surface and rear surfaces by ink jet printing. That is, a printing pattern may be printed into material of a backseat and may be printed to the at least 1st of surface and rear surfaces of an outer layer sheet material which consists of one or more layers. When it prints to any 2nd [ or more ] page, by using an outer layer sheet as translucent raw material, it becomes discriminable [ each printing pattern ] and it also becomes possible to print a separate printing pattern to each field, or to pile up each printing pattern and to consider it as one pattern. An outer layer sheet also carries out work of protection of a printing surface by printing inside an outside surface of an outermost layer sheet.

[0012]The 3rd of this invention is a printing method of an absorptivity wearing article indicated to the 1st invention or invention of the 2nd setting and giving like an assembler who assembles and goes, rewinding continuously each member which constitutes an absorptivity wearing article for said ink jet printing to a predetermined member. By setting and giving like an assembler, it becomes possible to print in arbitrary positions of a member.

[0013]In an absorptivity wearing article in which the 4th of this invention has a fluid permeability top sheet, a backseat of fluid impermeability, and an absorber arranged among these both sheets, It is the absorptivity wearing article to which printing, wherein a printing pattern which can be recognized from the exterior is given to the 1st [ at least ] page of a member arranged at a position which can be recognized from the exterior of an absorptivity wearing article at the time of wear by ink jet printing was performed. That is, a printing pattern is printed by field of a member arranged at a position which can be recognized from the exterior of an absorptivity wearing article at the time of wear, When a backseat is translucent or provides a translucent outer layer sheet in the outside of a backseat further, printing may be performed to two or more members, and printing may be performed to both sides of a member.

[0014]

[Embodiment of the Invention]According to the absorptivity wearing article of this invention, the printing pattern which can be recognized from an outside surface at the time of wear is given by ink jet printing, Since ink jet printing does not need the printing roll engraved like the conventional gravure printing or flexographic printing, The picture pattern according to a product brand name, product size, the directions of a product, and the wearer's taste, etc. are theoretically printed by an infinite pattern to the material which forms an absorptivity wearing article, and it becomes possible to improve the simple nature at the time of use, and the amenity. That is, since the engraved printing roll is used in gravure printing or flexographic printing and the outside diameter size of a printing roll has a limit, even if it tries to increase the kind of picture pattern, there are at most 4-5 kinds of picture pattern which can be continuously printed into a predetermined material, but. In ink jet printing, since a picture pattern can be changed for every time, it becomes possible to increase the kind of picture pattern substantially.

[0015]Under the present circumstances, ink jet printing is set as the assembler who assembles and goes while rewinding each material of an absorptivity wearing article (for it to also be called an assembly process), If it gives to the target member, it will become

easy for the predetermined part in an absorptivity wearing article to arrange a printing pattern, and this position will become possible [ setting up arbitrarily ] further. Therefore, it becomes possible to clarify distinction of a rear surface or to give signs that it becomes a rule of thumb of fixed positions, such as adhesive tape for fixing an absorptivity wearing article to a wearer's body, approximately at the time of wear.

[0016]By setting and performing ink JIETO printing like the assembler of each material who manufactures an absorptivity wearing article, Since it becomes possible to give a printing pattern to the position of material by arranging the print head in the required position at the time of the material which needs printing flowing, and printing at a required interval, Unlike the case where material printed beforehand is rewound and assembled, application of material is limited by neither a printing pattern nor the printing pattern which change of a print point is easy and needs.

[0017]Process printing becomes possible by printing the printing pattern of a color which assembles two or more print heads from which the color of ink differs, arranges along the flow direction of the material of a process, and is different in the same member, or printing and laying the printing pattern of a color different, respectively on top of a separate member. Printing in a large area is also attained by arranging two or more print heads in accordance with a direction vertical to the flow direction of material.

[0018]Thus, although ink jet printing is setting like the assembler of an absorptivity wearing article and printing a picture pattern required for a required part to the material which is not printed and the effect can be demonstrated more greatly, This is because ink jet printing does not need the engraved printing roll unlike gravure printing or flexographic printing, so it has the characteristic that it sets like the assembler of an absorptivity wearing article, and can print easily. When it is only the purpose to increase the kind of picture pattern, Although it prints beforehand by ink jet printing to material, and it can also assemble like an assembler like the conventional method, adjusting so that this printing pattern may be arranged at the specific position of an absorptivity wearing article, In order to carry out the purpose of this invention effectively, it is the best method to consider it as the on-line printing method which prints by assembling and being in process.

[0019]Next, in the manufacturing process of the absorptivity wearing article in this invention, on-line \*\*\* ink jet printing is performed, and an example of the concrete method which manufactures an absorptivity wearing article is described below. Set like an assembler and each member (material) which constitutes the absorptivity wearing article rolled round by rolled form is rewound, Among such materials, to the charge of a printed material, a required printing pattern is given by the print head installed on the material after rewinding, and a predetermined printing pattern is arranged at the position of the completed absorptivity wearing article. Since it becomes [ two or more ], when giving and laying a printing pattern on top of two or more translucent charges of a printed material especially, and completed, it is important for these charges of a printed material that a printing pattern is arranged mutually at a position, but. By starting printing in the printing method of this invention according to phases, such as a cutter rotor (rotor of the cutter which cuts out the absorptivity wearing article of a continuity) used as a standard, Since the position printed arbitrarily can be set up to each charge of a printed material, the print point between the charges of a printed material can also be set up easily.

[0020]Subsequently, an assembly is carried out to firm attachment materials, such as

material of the absorber which are other materials, material of an extensible elastic member, and a tape, etc., and the absorptivity wearing article as a continuity is obtained. Then, after providing a notch section that it should consider as the last gestalt, in order to consider it as each article, cutting is given by the aforementioned cutter. Irrespective of the existence of implementation of on-line printing, these processes are carried out according to the position by which the usual material by which an assembly is carried out is arranged, and are especially satisfactorily feasible by the usual art.

[0021]In manufacture of the absorptivity wearing article provided with gestalten with various this invention, It is what gives the printing pattern which can be recognized from the exterior by ink jet printing, Since this ink jet printing is assembled and it gives in a process, the composition of a printing material which is the material in which ink jet printing is possible and whose recognition is attained from the exterior about the material of the absorptivity wearing article in which it is printed is required. For example, in the case where a polyethylene film is used outside as a backseat of fluid impermeability, When a translucent thing is used as a polyethylene film so that printing on the outside surface of a polyethylene film is possible, Printing to the inner surface of a polyethylene film is possible, and when what wrapped the absorbent material in the absorbent paper is used further in this case, it is also possible to print on the inner surface or outside surface of an absorbent paper, and to make recognition possible from the exterior.

[0022]When the outer layer sheet of one more or more layers has been arranged on the outside surface of a backseat, it is also possible to make recognition possible from an outside surface. In this case, a pattern can be independently printed using a sheet translucent as an outer layer sheet in a position which is different in both the 2nd [ at least ] page, a backseat and an outer layer sheet, and each pattern can also make recognition possible from the exterior. As an outer layer sheet, it is usable and a nonwoven fabric sheet etc. are possible also for making an extensible elastic member pinch among both sheets using the nonwoven fabric sheet which consists of two-layer as an outer layer sheet.

[0023]That is, to which member ink jet printing is performed in the absorptivity wearing article of this invention. If it is possible to make recognition possible from the exterior of an absorptivity wearing article, any of a fluid permeability backseat, the absorbent paper which wraps in an absorbent material, and an outermost layer sheet may be chosen, and it can print to two or more members, and recognition can also be made possible from the exterior, respectively.

[0024]In this invention, extend a backseat and an outermost layer sheet from the edges-on-both-sides part of an absorbent material, and a side flap part is formed. Consider it as the absorptivity wearing article of the gestalt which arranged the fastener for immobilization in the side flap part, or, In order to consider it as the absorptivity wearing article which made join beforehand the sides which the side flap part order bodice faced, and was formed in the trousers type or to prevent the gap at the time of wear, the extensible elastic member may be arranged to the circumference opening of a biped, or the circumference opening of the waist.

[0025]Although not limited especially as ink used for ink jet printing in this invention, selection by the material used as the object which prints is also required. As opposed to the polyethylene film and nonwoven fabric which are mostly used as a material of a backseat or an outer layer sheet, If paints or a color is distributed in a fluid, it is usable



and selection of the ink of the hot melt type distributed in a wax which serves as a fluid at the time of heating at the thing distributed underwater or in the solvent and ordinary temperature even if it was a solid is also possible. A wax type is good especially when printing to a nonwoven fabric.

[0026]

[Example] This invention is explained in detail below with reference to the drawing in which the example of this invention is shown. Drawing 1 is a perspective view showing absorptivity \*\*\*\*\* beforehand formed in the trousers type in the example of this invention. The absorptivity wearing article 1 of this invention shown in drawing 1 has the circumference opening 2 of a leg, and the circumference opening 3 of the waist, and adhesion closing of 5 is carried out by the side seam 6 at the back bodice 4 formed by extending between the circumference openings of said leg on either side, and the past time.

It has trousers type shape and the printing pattern 7 which can be recognized from the exterior at the time of wear is given to 4 sides by ink jet printing at the later self time.

[0027] Drawing 2 is a sectional view showing the state where carried out open deployment of the side seam 6 of the absorptivity wearing article 1 of this invention shown by drawing 1, elongated, and it cut in the direction parallel to the circumference opening 3 of the waist in 4 at the later self time. The top sheet 8 and the fluid impermeability backseat 9 of fluid permeability [wearing article / 1 / absorptivity], Consist of the absorber 10 arranged among these both sheets, and the absorber 10 via the absorbent paper 11. The fluid permeability top sheet 8, It is in contact with the fluid impermeability backseat 9 via the absorbent paper 12, and the printing pattern 7 which can be recognized from the exterior at the time of wear is given by ink jet printing between the backseat 9 of fluid impermeability, and the absorbent paper 12. In this case, the fluid impermeability backseat 9 is a translucent sheet, and ink jet printing may be performed to the fluid impermeability backseat 9, and may be performed to the absorbent paper 12. A position is shifted to both fields and the respectively different printing pattern may be given.

[0028] Drawing 3 is that the printing pattern which can be recognized from the exterior at the time of wear indicated another example given by ink jet printing to be in the absorptivity wearing article 1 in the example of this invention shown in drawing 1 or drawing 2. They are some sectional views showing the state where it cut in the direction parallel to the circumference opening 3 of the waist in the back bodice 4. The absorptivity wearing article 1 of this invention shown in drawing 3. The fluid permeability top sheet 8, Consisting of the fluid impermeability backseat 9 and the absorber 10 arranged among these both sheets, the absorber 10 is in contact with the fluid permeability top sheet 8 with the fluid impermeability backseat 9 via the absorbent paper 12 again via the absorbent paper 11.

The printing pattern 7 which can be recognized from the exterior on the outside surface of the backseat 9 of fluid impermeability at the time of wear is given by ink jet printing.

[0029] Drawing 4 is that the printing pattern which can be recognized from the exterior at the time of wear indicated another example given by ink jet printing to be in the absorptivity wearing article 1 in the example of this invention shown in drawing 1 or

drawing 2, They are some sectional views showing the state where it cut in the direction parallel to the circumference opening 3 of the waist in the back bodice 4. The absorptivity wearing article 1 of this invention shown in drawing 4 The fluid permeability top sheet 8, Consisting of the fluid impermeability backseat 9 and the absorber 10 arranged among these both sheets, the absorber 10 is in contact with the fluid permeability top sheet 8 with the fluid impermeability backseat 9 via the absorbent paper 12 again via the absorbent paper 11.

The outer layer sheet 14 arranged at the outer layer sheet 13 and the outside which have been arranged inside is arranged in this order at the outside of the backseat 9 of fluid impermeability, A printing pattern is given by ink jet printing between the outer layer sheet 13 and the outer layer sheet 14, and since the outer layer sheet 14 is translucent, this printing pattern can be recognized from the exterior at the time of wear.

The printing pattern may be given to which [ of the outer layer sheet 13 and the outer layer sheet 14 ] side, and a position is shifted to both fields and the respectively different printing pattern may be given. It can also be considered as the pattern of process printing by giving and laying the printing pattern of a color different, respectively on top of the outer layer sheet 13 and the outer layer sheet 14, and considering it as one pattern.

[0030]In the absorptivity wearing article of drawing 4, one outer layer sheet can be accepted on the outside of the backseat 9 of fluid impermeability, and can be arranged on it, and the printing pattern which can be recognized from an outside surface between the backseat 9 of fluid impermeability and an outer layer sheet at the time of wear can also be given by ink jet printing. In this case, ink jet printing may be performed to which [ of the backseat 9 of fluid impermeability, and an outer layer sheet ] side by using an outer layer sheet as a translucent sheet. A position can be shifted to both fields, a respectively different printing pattern may be given, and it can also be considered as the pattern of process printing by printing a color which is different in each field, and piling up.

[0031]Drawing 5 is a side view showing the principle of the equipment for setting like the assembler of an absorptivity wearing article and performing on-line printing to the material of an absorbent paper, the backseat of fluid impermeability, and an outer layer sheet in the absorptivity wearing article of this invention, The print head of ink jet printing can be arranged between the roll kneaders which convey material, a control device can emit a print command signal with the signal (not shown) of phases, such as a cutter rotor used as a standard, and the speed signal detected from the number of rotations of the roll kneader, and a predetermined printing pattern can be given to a prescribed position. It may dry by forming a dryer behind the print head, desiccation is sped up, and it is effective for the preventable contamination in undried ink.

[0032]Drawing 6 is set like the assembler of an absorptivity wearing article to the material of an absorbent paper, the backseat of fluid impermeability, and an outer layer sheet in the absorptivity wearing article of this invention, Although it is a top view of drawing 6 in which the principle of the equipment for performing on-line printing was shown, a control device emits a print command signal with the speed signal etc. which were detected from the roll kneader and a predetermined printing pattern is printed to a position, If needed, a position can be changed arbitrarily and it is shown that a predetermined printing pattern is also changed arbitrarily and can be set up. That is, it is possible to choose a print point, a printing pattern, and concentration arbitrarily.

[0033]As a fluid permeability top sheet used for the trousers type usage \*\*\*\* diaper of

this invention, the fluid permeability nonwoven fabric which consists of polyethylene, polypropylene, polyester, and a synthetic fiber that used other thermoplastics as the raw material can be used. As a backseat of fluid impermeability, the polyethylene sheet of fluid impermeability, It is selectable from what etc. pasted together the polyethylene sheet which provided the fine hole preferably, the liquid impermeable sheet with the moisture permeability which added and extended the filler to thermoplastics or the sheet of such fluid impermeability, and the nonwoven fabric. In order to enable an outside surface to recognition of the printing pattern given to the inner surface of the backseat from the purpose of this invention, the appending rate of the filler to the thermoplastics in which it is required with which to have moderate visible light transmissivity, and it serves as a raw material of a backseat can adjust, but. A fear of being steamed if moisture permeability is given disappears, and it is more comfortable.

[0034]The circumference of a biped the circumference opening extensible elastic member of the waist Urethane thread, The elastic body used for the usual usage \*\*\*\* diapers, such as thread rubber, can be used as it is, and adhesion fixing of these extensible elastic members is carried out to the predetermined field with hot melt adhesive in the circumference opening of a leg, and the circumference opening of the waist by the expanded state, respectively.

[0035]In fluff pulp, what used superabsorbency polymer together is preferred to a principal member, in addition, as for an absorbent material, mixtures and laminated material, such as absorbent-paper independence or thermal melting arrival textiles, are used for it. Although it may be preferred to consider it as the laminated structure which wrapped the whole in absorbent papers, such as tissue, and a sandglass type or a \*\* type may be sufficient as the shape of an absorber, fit nature with the better sandglass type is obtained.

[0036]Although an outermost layer sheet, an outer layer sheet, and the inner layer sheet can use the nonwoven fabric which consists of polyethylene, polypropylene, polyester, and a synthetic fiber that used other thermoplastics as the raw material, In order to enable an outside surface to recognition of the printing pattern given to the inner surface of the backseat from the purpose of this invention, it is required to have moderate visible light transmissivity, and it is good to consider it as 10 - 30 g/m<sup>2</sup> as eyes of a nonwoven fabric.

[0037]

[Effect of the Invention]According to the printing method of this invention, give the printing pattern which can be recognized from the exterior at the time of absorptivity wearing article wear by ink jet printing, but. Since ink jet printing does not need the printing roll engraved like the conventional gravure printing or flexographic printing, It becomes possible to print arbitrarily the picture pattern according to a product brand name, product size, the directions of a product, and the wearer's taste, etc. by all patterns to the member of an absorptivity wearing article. Therefore, it becomes possible to increase the kind of picture pattern of the absorptivity wearing article put in 1 package unit for shipment (packaging bag) with the printing method of this invention, and a variety of absorptivity wearing articles are obtained, and it becomes possible to improve the amenity by the simple nature at the time of a user's use, visual satisfaction, etc.

[0038]Since it becomes possible to arrange a printing pattern to the arbitrary parts of an absorptivity wearing article by giving to the material which sets ink jet printing like the assembler of each material in the manufacturing process of an absorptivity wearing

article, and targets it, For example, it becomes easy to arrange signs that distinction of a rear surface is clarified, in a specific position, or to give signs that it becomes a rule of thumb of fixed positions, such as adhesive tape which fixes an absorptivity wearing article to a wearer's body, approximately at the time of wear.

[0039]By setting like the assembler of each material to an absorptivity wearing article, and carrying out ink JIETO printing, Unlike the case where it assembles rewinding and supplying the material rolled round by printed rolled form from a feed unit, application of material is not limited by the printing pattern which correspondence becomes easy and needs in the middle of an assembly also when a size substitute etc. are required.

[0040]Process printing becomes possible by printing the printing pattern of a color which assembles two or more print heads from which the color of ink differs, arranges along the flow direction of the material of a process, and is different in the same member, or printing and laying the printing pattern of a color different, respectively on top of a separate member. Wide range printing is also attained by arranging two or more print heads in accordance with a direction vertical to the flow direction of material.

## **TECHNICAL FIELD**

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[Field of the Invention] This invention relates to the absorptivity wearing article printed by the printing method which gives a printing pattern to the member of an absorptivity wearing article, and this printing method in the manufacturing process of an absorptivity wearing article.

## PRIOR ART

[Description of the Prior Art]Conventionally, the absorptivity wearing article has an absorber arranged between a fluid permeability top sheet, the backseat of fluid impermeability, and these both sheets.

Mainly hold with an absorber excrement, such as urine excreted at the time of wear, via a fluid permeability top sheet, and by the backseat of fluid impermeability. It is used as that which prevents excrement beginning to leak out of an absorptivity wearing article, and the thing of various gestalten, such as having an extensible elastic member and a fastener for immobilization so that it may use according to the use and can be used as an absorptivity wearing article of \*\*\*\*, and being beforehand formed in the trousers type, is devised.

[0003]As the above-mentioned absorptivity wearing article, the usage \*\*\*\* diaper for infants, the object for adult's incontinentia persons, or the usage \*\*\*\* diaper for person requiring cares is devised, and it is used widely.

[0004]It adds to the operation which holds original excrement for article itself to these absorptivity wearing article, Although a means to make a wearer do wear immobilization of the article, a means by which shut up excrement in an article and displeasure is not given to a wearer, and a means to make it excrement not begin to leak out of an article possess, and these means act effectively and constitute the article, For example, when wearing oneself said absorptivity wearing article in which the small child was formed in the trousers type, or when a care worker makes it wear to an adult, it is also necessary to have the means which makes distinction of a rear surface easy before and after a wear nature article.

[0005]If it doubles also when these absorptivity wearing articles have the necessity of using that from which size differed according to a wearer's form and the usage \*\*\*\* diaper for infants is considered especially, It will become a required function if establishing a picture pattern which the size indication which can be distinguished, and infants like at a glance also considers the simple nature at the time of use, and the amenity.

[0006]For this reason, so that recognition may become possible from the outside of an absorptivity wearing article conventionally, Printing beforehand a product brand name, product size, and the picture pattern in which infants, such as an animal and a vehicle, are fond in for infants to the backseat of fluid impermeability or the fastener for immobilization, or arranging a picture pattern in specific positions, such as a backseat, for the purpose, such as distinction of a rear surface, is performed widely.

[0007]However, printing of a picture pattern etc. is made when the assembler of an absorptivity wearing article prints a picture pattern beforehand in a front process to individual materials, such as a backseat which forms an absorptivity wearing article, and a fastener, more.

The printing means for such materials is performing flexographic printing, gravure printing, etc. generally, and is performed.

## EFFECT OF THE INVENTION

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[Effect of the Invention]According to the printing method of this invention, give the printing pattern which can be recognized from the exterior at the time of absorptivity wearing article wear by ink jet printing, but. Since ink jet printing does not need the printing roll engraved like the conventional gravure printing or flexographic printing, It becomes possible to print arbitrarily the picture pattern according to a product brand name, product size, the directions of a product, and the wearer's taste, etc. by all patterns to the member of an absorptivity wearing article. Therefore, it becomes possible to increase the kind of picture pattern of the absorptivity wearing article put in 1 package unit for shipment (packaging bag) with the printing method of this invention, and a variety of absorptivity wearing articles are obtained, and it becomes possible to improve the amenity by the simple nature at the time of a user's use, visual satisfaction, etc.

[0038]Since it becomes possible to arrange a printing pattern to the arbitrary parts of an absorptivity wearing article by giving to the material which sets ink jet printing like the assembler of each material in the manufacturing process of an absorptivity wearing article, and targets it, For example, it becomes easy to arrange signs that distinction of a rear surface is clarified, in a specific position, or to give signs that it becomes a rule of thumb of fixed positions, such as adhesive tape which fixes an absorptivity wearing article to a wearer's body, approximately at the time of wear.

[0039]By setting like the assembler of each material to an absorptivity wearing article, and carrying out ink JIETO printing, Unlike the case where it assembles rewinding and supplying the material rolled round by printed rolled form from a feed unit, application of material is not limited by the printing pattern which correspondence becomes easy and needs in the middle of an assembly also when a size substitute etc. are required.

[0040]Process printing becomes possible by printing the printing pattern of a color which assembles two or more print heads from which the color of ink differs, arranges along the flow direction of the material of a process, and is different in the same member, or printing and laying the printing pattern of a color different, respectively on top of a separate member. Wide range printing is also attained by arranging two or more print heads in accordance with a direction vertical to the flow direction of material.

## TECHNICAL PROBLEM

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[Problem(s) to be Solved by the Invention] Since flexographic printing currently performed from the former and gravure printing are performed by the engraved printing roll to the material of each member which constitutes an absorptivity wearing article, they cannot but become what continued at the interval with a constant picture pattern of the limited kind. That is, since the outside diameter size of a printing roll has a limit, thereby, the kind of picture pattern of the absorptivity wearing article in which the kind of picture pattern which can be continuously printed into the material of a predetermined member is a limit, and at most 4-5 kinds can put it in 1 package unit for shipment is also restricted. When assembling and manufacturing an absorptivity wearing article, (It sets like an assembler), Since rewind continuously the material of each member which constitutes the absorptivity wearing article generally rolled round by printed rolled form, it is supplied from a feed unit, it \*\*\*\*s to predetermined length through an adhesion assembly and the article is manufactured, it is difficult to arrange a picture pattern to the specific position of these members in a finished product. And when describing the character of product size in material, Since it becomes impossible to use as a material of the article of different size even if material widths were the same, when carrying out size \*\*\*\* (change to manufacture of the product in which sizes differ) in the middle of manufacture, inconvenience arises and efficient manufacture becomes impossible.

[0009] In [ this invention solves the above problems and ] manufacture of an absorptivity wearing article, It enables it to increase the kind of printing pattern given to an absorptivity wearing article, and to print a printing pattern easily to the specific position of an absorptivity wearing article. It realizes enabling it to print the distinction sign (pattern) etc. which were not being printed conventionally, to change a printing pattern easily with the variety in the middle of manufacture, or change of size further, etc., and let not only raising the simple nature and the visual degree of satisfaction at the time of a user's use but improvement in productive efficiency be the purpose. In manufacture of an absorptivity wearing article, this invention person finds out giving the printing pattern which can be recognized from an outside surface at the time of wear by ink jet printing, and came to complete this invention.



## MEANS

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[Means for Solving the Problem]The 1st of this invention A fluid permeability top sheet and a backseat of fluid impermeability, It is a printing method for manufacture of an absorptivity wearing article which has an absorber arranged among these both sheets and in which a printing pattern which can be recognized from the exterior at the time of wear is given, It is a printing method of an absorptivity wearing article giving this printing pattern by ink jet printing to a predetermined material of this absorptivity wearing article. Words and phrases of a printing pattern in this invention mean a printing content at large [, such as a picture pattern, a sign, and a character, ].

[0011]The 2nd of this invention has composition for which an absorptivity wearing article of the 1st invention has arranged one or more layers of outer layer sheets which become the outside of a backseat from a nonwoven fabric etc., It is a printing method of an absorptivity wearing article indicated to the 1st invention giving a printing pattern which can be recognized from the exterior at the time of wear to the at least 1st of this backseat and these outer layer sheet surface and rear surfaces by ink jet printing. That is, a printing pattern may be printed into material of a backseat and may be printed to the at least 1st of surface and rear surfaces of an outer layer sheet material which consists of one or more layers. When it prints to any 2nd [ or more ] page, by using an outer layer sheet as translucent raw material, it becomes discriminable [ each printing pattern ] and it also becomes possible to print a separate printing pattern to each field, or to pile up each printing pattern and to consider it as one pattern. An outer layer sheet also carries out work of protection of a printing surface by printing inside an outside surface of an outermost layer sheet.

[0012]The 3rd of this invention is a printing method of an absorptivity wearing article indicated to the 1st invention or invention of the 2nd setting and giving like an assembler who assembles and goes, rewinding continuously each member which constitutes an absorptivity wearing article for said ink jet printing to a predetermined member. By setting and giving like an assembler, it becomes possible to print in arbitrary positions of a member.

[0013]In an absorptivity wearing article in which the 4th of this invention has a fluid permeability top sheet, a backseat of fluid impermeability, and an absorber arranged among these both sheets, It is the absorptivity wearing article to which printing, wherein a printing pattern which can be recognized from the exterior is given to the 1st [ at least ] page of a member arranged at a position which can be recognized from the exterior of an absorptivity wearing article at the time of wear by ink jet printing was performed. That is, a printing pattern is printed by field of a member arranged at a position which can be recognized from the exterior of an absorptivity wearing article at the time of wear, When a backseat is translucent or provides a translucent outer layer sheet in the outside of a backseat further, printing may be performed to two or more members, and printing may be performed to both sides of a member.

[0014]

[Embodiment of the Invention]According to the absorptivity wearing article of this invention, the printing pattern which can be recognized from an outside surface at the time of wear is given by ink jet printing, Since ink jet printing does not need the printing roll engraved like the conventional gravure printing or flexographic printing, The picture

pattern according to a product brand name, product size, the directions of a product, and the wearer's taste, etc. are theoretically printed by an infinite pattern to the material which forms an absorptivity wearing article, and it becomes possible to improve the simple nature at the time of use, and the amenity. That is, since the engraved printing roll is used in gravure printing or flexographic printing and the outside diameter size of a printing roll has a limit, even if it tries to increase the kind of picture pattern, there are at most 4-5 kinds of picture pattern which can be continuously printed into a predetermined material, but. In ink jet printing, since a picture pattern can be changed for every time, it becomes possible to increase the kind of picture pattern substantially.

[0015]Under the present circumstances, ink jet printing is set as the assembler who assembles and goes while rewinding each material of an absorptivity wearing article (for it to also be called an assembly process), If it gives to the target member, it will become easy for the predetermined part in an absorptivity wearing article to arrange a printing pattern, and this position will become possible [ setting up arbitrarily ] further. Therefore, it becomes possible to clarify distinction of a rear surface or to give signs that it becomes a rule of thumb of fixed positions, such as adhesive tape for fixing an absorptivity wearing article to a wearer's body, approximately at the time of wear.

[0016]By setting and performing ink JIETO printing like the assembler of each material who manufactures an absorptivity wearing article, Since it becomes possible to give a printing pattern to the position of material by arranging the print head in the required position at the time of the material which needs printing flowing, and printing at a required interval, Unlike the case where material printed beforehand is rewound and assembled, application of material is limited by neither a printing pattern nor the printing pattern which change of a print point is easy and needs.

[0017]Process printing becomes possible by printing the printing pattern of a color which assembles two or more print heads from which the color of ink differs, arranges along the flow direction of the material of a process, and is different in the same member, or printing and laying the printing pattern of a color different, respectively on top of a separate member. Printing in a large area is also attained by arranging two or more print heads in accordance with a direction vertical to the flow direction of material.

[0018]Thus, although ink jet printing is setting like the assembler of an absorptivity wearing article and printing a picture pattern required for a required part to the material which is not printed and the effect can be demonstrated more greatly, This is because ink jet printing does not need the engraved printing roll unlike gravure printing or flexographic printing, so it has the characteristic that it sets like the assembler of an absorptivity wearing article, and can print easily. When it is only the purpose to increase the kind of picture pattern, Although it prints beforehand by ink jet printing to material, and it can also assemble like an assembler like the conventional method, adjusting so that this printing pattern may be arranged at the specific position of an absorptivity wearing article, In order to carry out the purpose of this invention effectively, it is the best method to consider it as the on-line printing method which prints by assembling and being in process.

[0019]Next, in the manufacturing process of the absorptivity wearing article in this invention, on-line \*\*\* ink jet printing is performed, and an example of the concrete method which manufactures an absorptivity wearing article is described below. Set like an assembler and each member (material) which constitutes the absorptivity wearing

article rolled round by rolled form is rewound, Among such materials, to the charge of a printed material, a required printing pattern is given by the print head installed on the material after rewinding, and a predetermined printing pattern is arranged at the position of the completed absorptivity wearing article. Since it becomes [ two or more ], when giving and laying a printing pattern on top of two or more translucent charges of a printed material especially, and completed, it is important for these charges of a printed material that a printing pattern is arranged mutually at a position, but. By starting printing in the printing method of this invention according to phases, such as a cutter rotor (rotor of the cutter which cuts out the absorptivity wearing article of a continuity) used as a standard, Since the position printed arbitrarily can be set up to each charge of a printed material, the print point between the charges of a printed material can also be set up easily.

[0020]Subsequently, an assembly is carried out to firm attachment materials, such as material of the absorber which are other materials, material of an extensible elastic member, and a tape, etc., and the absorptivity wearing article as a continuity is obtained. Then, after providing a notch section that it should consider as the last gestalt, in order to consider it as each article, cutting is given by the aforementioned cutter. Irrespective of the existence of implementation of on-line printing, these processes are carried out according to the position by which the usual material by which an assembly is carried out is arranged, and are especially satisfactorily feasible by the usual art.

[0021]In manufacture of the absorptivity wearing article provided with gestalten with various this invention, It is what gives the printing pattern which can be recognized from the exterior by ink jet printing, Since this ink jet printing is assembled and it gives in a process, the composition of a printing material which is the material in which ink jet printing is possible and whose recognition is attained from the exterior about the material of the absorptivity wearing article in which it is printed is required. For example, in the case where a polyethylene film is used outside as a backseat of fluid impermeability, When a translucent thing is used as a polyethylene film so that printing on the outside surface of a polyethylene film is possible, Printing to the inner surface of a polyethylene film is possible, and when what wrapped the absorbent material in the absorbent paper is used further in this case, it is also possible to print on the inner surface or outside surface of an absorbent paper, and to make recognition possible from the exterior.

[0022]When the outer layer sheet of one more or more layers has been arranged on the outside surface of a backseat, it is also possible to make recognition possible from an outside surface. In this case, a pattern can be independently printed using a sheet translucent as an outer layer sheet in a position which is different in both the 2nd [ at least ] page, a backseat and an outer layer sheet, and each pattern can also make recognition possible from the exterior. As an outer layer sheet, it is usable and a nonwoven fabric sheet etc. are possible also for making an extensible elastic member pinch among both sheets using the nonwoven fabric sheet which consists of two-layer as an outer layer sheet.

[0023]That is, to which member ink jet printing is performed in the absorptivity wearing article of this invention. If it is possible to make recognition possible from the exterior of an absorptivity wearing article, any of a fluid permeability backseat, the absorbent paper which wraps in an absorbent material, and an outermost layer sheet may be chosen, and it can print to two or more members, and recognition can also be made possible from the exterior, respectively.

[0024]In this invention, extend a backseat and an outermost layer sheet from the edges-on-both-sides part of an absorbent material, and a side flap part is formed, Consider it as the absorptivity wearing article of the gestalt which arranged the fastener for immobilization in the side flap part, or, In order to consider it as the absorptivity wearing article which made join beforehand the sides which the side flap part order bodice faced, and was formed in the trousers type or to prevent the gap at the time of wear, the extensible elastic member may be arranged to the circumference opening of a biped, or the circumference opening of the waist.

[0025]Although not limited especially as ink used for ink jet printing in this invention, selection by the material used as the object which prints is also required. As opposed to the polyethylene film and nonwoven fabric which are mostly used as a material of a backseat or an outer layer sheet, If paints or a color is distributed in a fluid, it is usable and selection of the ink of the hot melt type distributed in a wax which serves as a fluid at the time of heating at the thing distributed underwater or in the solvent and ordinary temperature even if it was a solid is also possible. A wax type is good especially when printing to a nonwoven fabric.

[0026]

## EXAMPLE

[Example] This invention is explained in detail below with reference to the drawing in which the example of this invention is shown. Drawing 1 is a perspective view showing absorptivity \*\*\*\*\* beforehand formed in the trousers type in the example of this invention. The absorptivity wearing article 1 of this invention shown in drawing 1 has the circumference opening 2 of a leg, and the circumference opening 3 of the waist, and adhesion closing of 5 is carried out by the side seam 6 at the back bodice 4 formed by extending between the circumference openings of said leg on either side, and the past time.

It has trousers type shape and the printing pattern 7 which can be recognized from the exterior at the time of wear is given to 4 sides by ink jet printing at the later self time.

[0027] Drawing 2 is a sectional view showing the state where carried out open deployment of the side seam 6 of the absorptivity wearing article 1 of this invention shown by drawing 1, elongated, and it cut in the direction parallel to the circumference opening 3 of the waist in 4 at the later self time. The top sheet 8 and the fluid impermeability backseat 9 of fluid permeability [wearing article / 1 / absorptivity], consist of the absorber 10 arranged among these both sheets, and the absorber 10 via the absorbent paper 11. The fluid permeability top sheet 8, it is in contact with the fluid impermeability backseat 9 via the absorbent paper 12, and the printing pattern 7 which can be recognized from the exterior at the time of wear is given by ink jet printing between the backseat 9 of fluid impermeability, and the absorbent paper 12. In this case, the fluid impermeability backseat 9 is a translucent sheet, and ink jet printing may be performed to the fluid impermeability backseat 9, and may be performed to the absorbent paper 12. A position is shifted to both fields and the respectively different printing pattern may be given.

[0028] Drawing 3 is that the printing pattern which can be recognized from the exterior at the time of wear indicated another example given by ink jet printing to be in the absorptivity wearing article 1 in the example of this invention shown in drawing 1 or drawing 2. They are some sectional views showing the state where it cut in the direction parallel to the circumference opening 3 of the waist in the back bodice 4. The absorptivity wearing article 1 of this invention shown in drawing 3. The fluid permeability top sheet 8, consisting of the fluid impermeability backseat 9 and the absorber 10 arranged among these both sheets, the absorber 10 is in contact with the fluid permeability top sheet 8 with the fluid impermeability backseat 9 via the absorbent paper 12 again via the absorbent paper 11.

The printing pattern 7 which can be recognized from the exterior on the outside surface of the backseat 9 of fluid impermeability at the time of wear is given by ink jet printing.

[0029] Drawing 4 is that the printing pattern which can be recognized from the exterior at the time of wear indicated another example given by ink jet printing to be in the absorptivity wearing article 1 in the example of this invention shown in drawing 1 or drawing 2. They are some sectional views showing the state where it cut in the direction parallel to the circumference opening 3 of the waist in the back bodice 4. The absorptivity wearing article 1 of this invention shown in drawing 4. The fluid permeability top sheet 8,

Consisting of the fluid impermeability backseat 9 and the absorber 10 arranged among these both sheets, the absorber 10 is in contact with the fluid permeability top sheet 8 with the fluid impermeability backseat 9 via the absorbent paper 12 again via the absorbent paper 11.

The outer layer sheet 14 arranged at the outer layer sheet 13 and the outside which have been arranged inside is arranged in this order at the outside of the backseat 9 of fluid impermeability, A printing pattern is given by ink jet printing between the outer layer sheet 13 and the outer layer sheet 14, and since the outer layer sheet 14 is translucent, this printing pattern can be recognized from the exterior at the time of wear.

The printing pattern may be given to which [ of the outer layer sheet 13 and the outer layer sheet 14 ] side, and a position is shifted to both fields and the respectively different printing pattern may be given. It can also be considered as the pattern of process printing by giving and laying the printing pattern of a color different, respectively on top of the outer layer sheet 13 and the outer layer sheet 14, and considering it as one pattern.

[0030]In the absorptivity wearing article of drawing 4, one outer layer sheet can be accepted on the outside of the backseat 9 of fluid impermeability, and can be arranged on it, and the printing pattern which can be recognized from an outside surface between the backseat 9 of fluid impermeability and an outer layer sheet at the time of wear can also be given by ink jet printing. In this case, ink jet printing may be performed to which [ of the backseat 9 of fluid impermeability, and an outer layer sheet ] side by using an outer layer sheet as a translucent sheet. A position can be shifted to both fields, a respectively different printing pattern may be given, and it can also be considered as the pattern of process printing by printing a color which is different in each field, and piling up.

[0031]Drawing 5 is a side view showing the principle of the equipment for setting like the assembler of an absorptivity wearing article and performing on-line printing to the material of an absorbent paper, the backseat of fluid impermeability, and an outer layer sheet in the absorptivity wearing article of this invention, The print head of ink jet printing can be arranged between the roll kneaders which convey material, a control device can emit a print command signal with the signal (not shown) of phases, such as a cutter rotor used as a standard, and the speed signal detected from the number of rotations of the roll kneader, and a predetermined printing pattern can be given to a prescribed position. It may dry by forming a dryer behind the print head, desiccation is sped up, and it is effective for the preventable contamination in undried ink.

[0032]Drawing 6 is set like the assembler of an absorptivity wearing article to the material of an absorbent paper, the backseat of fluid impermeability, and an outer layer sheet in the absorptivity wearing article of this invention, Although it is a top view of drawing 6 in which the principle of the equipment for performing on-line printing was shown, a control device emits a print command signal with the speed signal etc. which were detected from the roll kneader and a predetermined printing pattern is printed to a position. If needed, a position can be changed arbitrarily and it is shown that a predetermined printing pattern is also changed arbitrarily and can be set up. That is, it is possible to choose a print point, a printing pattern, and concentration arbitrarily.

[0033]As a fluid permeability top sheet used for the trousers type usage \*\*\*\* diaper of this invention, the fluid permeability nonwoven fabric which consists of polyethylene, polypropylene, polyester, and a synthetic fiber that used other thermoplastics as the raw material can be used. As a backseat of fluid impermeability, the polyethylene sheet of

fluid impermeability, It is selectable from what etc. pasted together the polyethylene sheet which provided the fine hole preferably, the liquid impermeable sheet with the moisture permeability which added and extended the filler to thermoplastics or the sheet of such fluid impermeability, and the nonwoven fabric. In order to enable an outside surface to recognition of the printing pattern given to the inner surface of the backseat from the purpose of this invention, the appending rate of the filler to the thermoplastics in which it is required with which to have moderate visible light transmissivity, and it serves as a raw material of a backseat can adjust, but. A fear of being steamed if moisture permeability is given disappears, and it is more comfortable.

[0034]The circumference of a biped the circumference opening extensible elastic member of the waist Urethane thread, The elastic body used for the usual usage \*\*\*\* diapers, such as thread rubber, can be used as it is, and adhesion fixing of these extensible elastic members is carried out to the predetermined field with hot melt adhesive in the circumference opening of a leg, and the circumference opening of the waist by the expanded state, respectively.

[0035]In fluff pulp, what used superabsorbency polymer together is preferred to a principal member, in addition, as for an absorbent material, mixtures and laminated material, such as absorbent-paper independence or thermal melting arrival textiles, are used for it. Although it may be preferred to consider it as the laminated structure which wrapped the whole in absorbent papers, such as tissue, and a sandglass type or a \*\* type may be sufficient as the shape of an absorber, fit nature with the better sandglass type is obtained.

[0036]Although an outermost layer sheet, an outer layer sheet, and the inner layer sheet can use the nonwoven fabric which consists of polyethylene, polypropylene, polyester, and a synthetic fiber that used other thermoplastics as the raw material, In order to enable an outside surface to recognition of the printing pattern given to the inner surface of the backseat from the purpose of this invention, it is required to have moderate visible light transmissivity, and it is good to consider it as 10 - 30 g/m<sup>2</sup> as eyes of a nonwoven fabric.

## DESCRIPTION OF DRAWINGS

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[Brief Description of the Drawings]

[Drawing 1]The perspective view of the usage \*\*\*\* diaper formed in the \*\*\*\*\* trousers type with the absorptivity wearing article of this invention.

[Drawing 2]The sectional view showing the state where opened wide and extended the side seam of the absorptivity wearing article of drawing 1, and it cut at the later self time.

[Drawing 3]The fragmentary sectional view in which being another example and showing the state where it cut in the back bodice with the absorptivity wearing article of this invention shown in drawing 2.

[Drawing 4]The fragmentary sectional view in which being another example and showing the state where it cut in the back bodice with the absorptivity wearing article of this invention shown in drawing 2 or drawing 3.

[Drawing 5]The side view showing the principle of the equipment which enforces the printing method of this invention.

[Drawing 6]The top view showing the principle of the equipment which enforces the printing method of this invention.

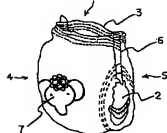
[Description of Notations]

- 1: Trousers type usage \*\*\*\* diaper
- 2: Circumference opening of a leg
- 3: Circumference opening of the waist
- 4: Later self time
- 5: Past time
- 6: Side seam
- 7: Printing pattern
- 8: A fluid permeability top sheet
- 9: The backseat of fluid impermeability
- 10: Absorber
- 11, 12: Absorbent paper
- 13, 14, 15: Outer layer sheet

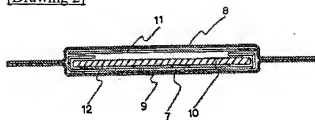


# DRAWINGS

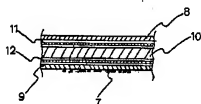
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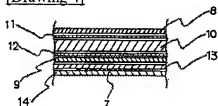
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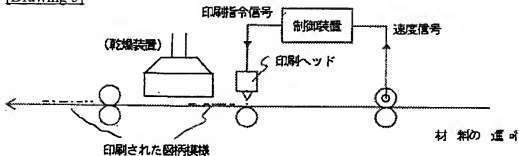
[Drawing 3]



[Drawing 4]



[Drawing 5]



[Drawing 6]

